Civilian Employment After Military Service

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ORIGINAL ARTICLE

The impact of prior deployment experience on civilian employment after military service

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ABSTRACT

Objective To determine if deployment to recent military operations or other health, demographic, or military-related characteristics were associated with employment after military service.

Methods Former US active duty military service members participating in the Millennium Cohort Study, a population-based sample of US military personnel that began in July of 2001, were prospectively followed from the time of baseline health reporting to self-reported employment status after military separation.

Results Of the 9099 separated personnel meeting inclusion criteria, 17% reported unemployment after military service. In multivariable modelling, prior deployment experiences, with or without reported combat, and post-traumatic stress disorder (PTSD) were not significantly associated with employment status postservice. Among those who routinely retired from service with a pension, positive screens for depression (OR, 1.67; 95% CI, 1.05 to 2.63) and panic/anxiety (OR, 1.63; 95% CI, 1.10 to 2.43) were significantly associated with subsequent unemployment. Poor physical health, female sex, black race, lower education and disabling illnesses/injuries were also predictive of postservice unemployment.

Conclusions After stratifying for reason for military separation, mental disorders like depression or panic/anxiety and poor physical health may have greater impact than prior deployment experiences or PTSD on the ability to find or maintain employment postservice. These findings may guide support for veterans most in need of job placement services after military service.

What this paper adds

- US service members have many unique experiences, such as multiple and prolonged military deployments, which have been shown to increase risk for postdeployment mental health morbidity.
- There is growing concern that deployments during the recent conflicts, and the accompanying societal stigma of adverse military experiences, may serve as a barrier to postservice employment.
- In multivariable modelling, prior deployment experiences and post-traumatic stress disorder (PTSD) were not significantly associated with job status postservice, while screening positive for depression or panic/anxiety or reporting poor physical health was associated with increased risk of postservice unemployment among certain groups.
- These findings provide a better understanding of the circumstances associated with unemployment postservice among US veterans which may have long-term health and economic impacts.

Service in the US armed forces offers training, resources for educational advancement, and valuable experience often sought by civilian employers. While service members share common workplace exposures with the general population, they also have unique experiences such as military deployment. Recent US military service, in particular, may be characterised by multiple and prolonged deployments. Service members who deployed during times of war and combat may face obstacles or discrimination when seeking employment in the civilian world due to common misperceptions, associated stereotypes, or readjustment issues.[1 2]

Stressful experiences while deployed in support of the operations in Iraq and Afghanistan have been shown to increase risk for postdeployment mental health morbidity that may have a significant, lasting impact on health.[3–6] A high proportion of services by the department of Veterans Affairs (VA) are for the care of mental disorders; in fact, in 2008, five of the top 20 most frequent discharge diagnoses were for mental disorders or substance abuse.[7] The burden of care on the VA system may be augmented due to unemployment associated with mental disorders, since lack of employment means no job-provided health insurance and individuals with mental illness often struggle in their efforts to obtain or maintain employment. Thus, there is growing concern that the recent conflicts and the reported increase in mental illness and their accompanying societal stigma may serve as a barrier to postservice employment.[8 9]

The Millennium Cohort Study was designed to longitudinally examine any impact military service may have on the health and well-being of service members during and after their military careers.[10–13] Few studies have examined the employability of returning OEF/OIF veterans,[14 15]

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and to our knowledge, no studies have examined the association of recent deployment experience prospectively with subsequent civilian employment among former active duty military personnel. The present study prospectively assesses whether civilian employment status differs among cohort members with deployment experience compared with those who did not deploy, and whether the effect of military deployments on employment is modified by mental health. Further, in accordance with VA concerns,[14] these analyses aimed to identify subgroups of the military who report lower rates of employment after separation from service, and who may potentially benefit from additional training, treatment, or support to successfully transition to civilian employment.

METHODS

Study population

The Millennium Cohort Study began collection of self-reported outcome and exposure data in 2001, prior to the start of recent combat operations in Iraq and Afghanistan, and resurveys its participants every 3 years through 2022. Using a phased enrolment strategy, the Millennium Cohort currently includes more than 150 000 members. Invited subjects to the first panel in 2001 included a probability-based sample of 256 400 regular active duty, Reserve, and National Guard members randomly drawn from electronic rosters at the Defense Manpower Data Center (DMDC) as of 1 October 2000, and contacted via postal mail, e-mail and questionnaire mailing to complete a paper or web survey. In 2004, a second panel of 150 000 regular active duty, Reserve and National Guard personnel with 1–2 years of military service as of 1 October 2003 was invited to complete a survey on the web or by paper. Other modes of contact and tailored messages were used during and between survey cycles, based on a modified Dillman approach,[16] to keep participants engaged in the study. Detailed descriptions of the methodology for the Millennium Cohort Study have been published elsewhere.[10–12]

The first panel of 77 047 consenting participants (36.0% of those believed to have been contacted) enrolled in 2001–2003. The first follow-up questionnaire (2004–2006) was completed by 55 021 members (71% response rate), and the second follow-up (2007–2008) was completed by 54 790 members (71%). The second panel (2004–2006) enrolled 31 110 consenting participants (25.4% of those believed to have been contacted), and 17 152 members (55%) completed one follow-up questionnaire (2007–2008). To be included in the current study, panels 1 and 2 participants must have been serving in the military on active duty status at the time of their baseline survey, completed at least one follow-up, and separated from the military between baseline and follow-up. Panel 1 participants who completed two follow-up surveys, had their demographic and health information assessed at the closest survey *prior to* their separation date, while their employment status was determined using the closest survey *after* their separation date.

Separation from the US military

Military separation status was determined using DMDC data, and confirmed with self-report where possible. Nearly all panel 2 participants (99%) were confirmed separated with self-report, compared with 53% of panel 1 participants confirmed with self-report. The question on the survey 'Are you currently serving in the military (active duty, Reserve, or National Guard)?' was not introduced until the 2007–2008 survey period; therefore, panel 1 subjects who separated prior to the first follow-up in 2004–2006 could not be verified with self-report. Among those with both records, fewer than 3% had discordant results and were excluded to reduce misclassification. DMDC maintains an archive of personnel data covering all service branches, components and phases of the military cycle (accession, separation, retirement). Electronic separation files included date of separation as well as codes that indicate the reason for separation. Participants were divided into three categories based on these codes: (1) those who fulfilled at least 20 years of service and had a pension (routinely retired), (2) those who fulfilled their contract term of service (typically 4 years) and (3) those who separated for all other reasons (eg, disability, parenthood, misconduct, early release). Contractual term of service at enlistment may vary by service branch and component, and may range between two and 6 years.[17] Of note, subjects in this study did not include any service members who separated prior to initial entry training because early separation of this nature did not fulfil inclusion criteria in the Millennium Cohort Study.

Civilian employment

Civilian employment was assessed at the closest survey following the service member's separation date. Employment status was determined by the question in the Millennium Cohort questionnaire, 'Do you have a civilian job at this time?', with the response options of 'Yes', 'No civilian employment at this time,' or 'Homemaker.' Those who reported 'yes' were defined as 'employed' and those who reported 'no civilian employment at this time' were termed 'unemployed' for the purposes of this paper. We could not determine whether these 'unemployed' individuals were actively seeking employment, however, so we could not equate this self-reported employment status to national unemployment rates which only include job seekers. Thus, unemployment rates are not presented for this study population. Those who answered 'Homemaker' were excluded from analyses because the numbers in this group were insufficient for multivariable modelling, and they represented a unique group (younger, married, 89% women) who could not easily be included with the employed or unemployed individuals.

Deployment experience

Military deployment data from DMDC were used to categorise individuals as not recently deployed and deployed with or without combat experience. Those with no deployments prior to military separation or only prior to baseline were considered not recently deployed. Deployed participants must have completed their first deployment between baseline and their date of separation. Combat experience was determined by at least one affirmative response to witnessing the following in the 3 years prior to outcome assessment: a person's death due to war, instances of physical abuse, dead and/or decomposing bodies, maimed soldiers or civilians, or prisoners of war or refugees.

Covariates

Covariates were assessed using the closest survey prior to separation from military service, and included the following: sex, age at separation, education, race/ethnicity, marital status, military pay grade (a surrogate for socioeconomic class), service branch, and military occupation. Time separated was also calculated by the number of days from the date of separation to the follow-up questionnaire. Period of study enrollment (panel 1 or 2) was also included since panel 1 members are proportionally older with more education and a higher pay grade than those in panel 2; attributes that may position them better for employment. Finally, we examined smoking status, alcohol-related problems (≥1 problem indicated a positive screen) as defined by the

Patient Health Questionnaire (PHQ),[18 19] disabling illness or injury (self-reported), life stressors (defined using the Holmes and Rahe Scale[20]), and physical component summary (PCS) score (assessed using the Short Form 36-Item Health Survey for Veterans (SF-36V)[21]). The SF-36V includes questions about general health, bodily pain and ability to work and carry out daily activities. Participants' health was categorised by percentile of the PCS score based on overall scores of panels 1 and 2 of the Millennium Cohort.

Mental disorders were also assessed using the closest survey prior to separation from military service, and were identified by screening tools embedded in the Millennium Cohort questionnaire. A positive screen for post-traumatic stress disorder (PTSD) was measured using the 17-item PTSD Checklist-Civilian Version.[22] Participants screened positive if they reported a moderate or higher level of at least one intrusion symptom, three avoidance symptoms, and two hyperarousal symptoms (criteria established by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (*DSM-IV-TR*)[23]). This approach has been shown to have high sensitivity and high internal consistency in this cohort.[24 25] A positive screen for depression was assessed using nine items from the PRIME-MD PHQ,[18] corresponding to the depression diagnosis from the *DSM-IV-TR*[23 26] with sensitivity of 0.93 and specificity of 0.89.[27] Screens for panic or other anxiety disorders also used the PHQ for a psychosocial assessment based on scores of several health concepts.[18 19]

Statistical analyses

Univariate analyses were conducted to evaluate the unadjusted associations between civilian employment and all covariates. Multivariable logistic regression models were built to calculate the odds of unemployment following military service in relation to deployment experience while adjusting for all covariates mentioned. Given the exploratory nature of this study, all defined variables were included. Model diagnostic tests were conducted and we assessed model fit using the Hosmer–Lemeshow goodness-of-fit test. To identify the existence of collinearity, we examined all variance inflation factors and considered a value of four or greater to indicate a potential problem.[28] First-order interactions between reason for separation and age at separation, and reason for separation and service branch were tested. Both interactions were significant at $p<0.10$. Three models were built to examine characteristics of those who left the military for routine retirement, fulfillment of service term, and for all other reasons. To assess whether the association between deployment and post service employment was modified by service members' mental health, we examined the interactions between deployment and each mental health variable in each stratified model. None of these interaction terms was significant ($p<0.10$); thus, we proceeded with constructing three models not stratified by deployment or mental health variables to estimate the association between prior deployment and postservice employment, adjusting for mental health and all other covariates. Data management and statistical analyses were performed using SAS software, V 9.3 (SAS Institute, Cary, North Carolina, USA).

RESULTS

Of the 80 524 Millennium Cohort members with at least one follow-up assessment, 13 832 separated between their baseline and last submitted follow-up. Participants who selected the 'Homemaker' option (n=588) and those missing outcome (n=450) or covariate (n=1720) information were excluded. Reservists and National Guard members (n=1975) were also removed because many already hold civilian occupations prior to military separation, leaving 9099 participants available for analyses (figure 1).

Characteristics of the population by employment status are shown in table 1. Overall, 17% did not have civilian employment postservice. The majority of the population (60.3%) retired with at least 20 years of service and a pension, 23.8% separated after fulfilling their service term, and 15.9% for other reasons. Mean age at separation was 37.3 years (sd, 9.1 years). χ^2 Tests revealed that positive screens for mental disorders were significantly higher among the unemployed, and a small but significant difference was found across employment categories among those with recent deployment experience. Unemployment was lowest among those who routinely retired (779/5488=14.2%), followed by those who fulfilled their service term (417/2165=19.3%) and those separated for other reasons (383/1446=26.5%).

In adjusted analyses, all covariates were included in the models (unless indicated N/A), and no issues with multicollinearity were detected using the previously described variance inflation factor criterion. All models fit the data well, as indicated by the Hosmer–Lemeshow goodness-of-fit test ($p>0.10$ for all). Prior deployment experience and PTSD were not associated with postservice unemployment (table 2) in multivariable analyses. Screening positive for depression (OR, 1.67; 95% CI, 1.05 to 2.63) or panic/anxiety (OR, 1.63; 95% CI, 1.10 to 2.43) was associated with significantly higher odds of unemployment, but only among those who routinely retired. Also among the routinely retired, unemployment was significantly associated with being female, reporting a disabling illness or injury, older age at separation, being non-Hispanic black, former Navy or Air Force members, current smokers and reporting poor health. Conversely, current and formerly married, more educated individuals and those separated longer than a year had reduced odds of unemployment.

Among those who separated after fulfilling their service term, reporting a disability, experiencing moderate stress, belonging to the younger cohort (panel 2), being non-Hispanic black, and female, significantly increased the odds of unemployment. Married respondents, former electronic equipment repairers, communications/intelligence specialists, and those separated for longer periods were less likely to be unemployed postservice (table 2).

Those who separated for other reasons were the most likely to be unemployed. Among this group, 48.8% of the unemployed left military service due to a disability, 12.5% left for a pregnancy or parenthood, and most of the remaining members underwent administrative discharge (eg, due to drug abuse, misconduct, unfitness) (data not shown). Characteristics associated with unemployment among those separated for other reasons included older age, being non-Hispanic black, and reporting poor physical health. Unemployment was less likely among those with a bachelor's degree or higher and those separated for longer than a year (table 2).

DISCUSSION

The intense and prolonged deployments during the recent operations in Iraq and Afghanistan, and increases in mental disorders among personnel exposed to combat,[4 6 29] have given rise to concern over the employability of veterans. To our knowledge, this is the first population-based study to prospectively quantify civilian employment in a large population of former active duty military personnel from all service branches. We found no association between deployment experience and employment status following separation. Routinely retired

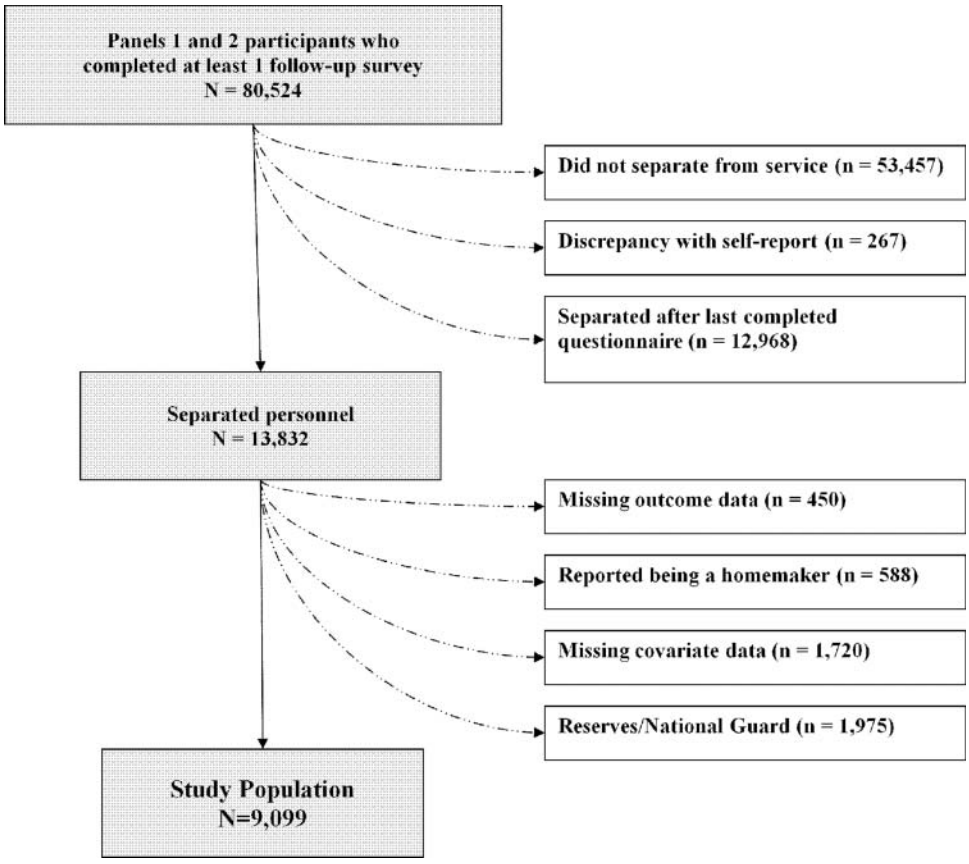

Figure 1 Flowchart of Millennium Cohort participants included in the study.

subjects screening positive for depression or panic/anxiety disorders were significantly more likely to report unemployment compared with subjects with no mental disorders. Other characteristics found to be associated with unemployment included black race, female sex, less education and poor physical health.

In this study, deployment experience did not increase risk of unemployment. This finding provides reassurance in light of frequent reference to high unemployment among veterans returning from Iraq and Afghanistan,[30] and is consistent with a March 2011 Bureau of Labour Statistics (BLS) news release stating that these veterans had unemployment rates that were not statistically different from veterans who had served elsewhere, nor did veterans who had entered military service since September 2001 have higher unemployment rates than non-veterans of the same age and gender group.[31] Military members selected for deployment are overall healthier than members who do not deploy;[3 4 6] thus, there may be other factors, like mental disorders, that are more influential on veterans' ability to obtain civilian employment.

Other important findings included the associations identified between some mental disorders and employment. Depression and anxiety disorders have been associated with work status and productivity in prior studies.[32 33] A challenge to define cause-effect relationships remains, since mood disorders may predispose one to employment issues, as well as result from unemployment or economic stressors.[34] An advantage of the prospective nature of this study was the ability to define mental disorders while participants were still serving in the military, such that these could be determined as factors potentially associated with subsequent unemployment. Our study did not find a significant association between PTSD and subsequent unemployment, which contrasts with one prior VA study of veterans in a vocational rehabilitation programme,[35] a discrepancy likely due to differences in study populations, design and methods. The broad representation of the military in the Millennium Cohort suggests that screening positive for PTSD prior to separation is not a major factor in employability postservice. This finding may be due to the strong support the military and VA have given to members with this 'signature injury,' or it may simply reflect differences in functional impairment between PTSD and mood disorders.[36] Also, it should be noted that the association between screening positive for PTSD and employment status existed at the crude level. However, after adjusting for variables such as depression, panic disorder, and physical component score, the association between PTSD and employment status was diminished. This may indicate potential overlap between comorbid mental disorders and physical health impairment that likely play a role, when taken together, on an individual's ability to find or maintain a job.

Additionally, across all groups we noted that those separated for longer time periods were less likely to be unemployed, likely because they had more time to search for a job. Since time was strongly predictive of postservice employment status, we also examined whether time modified the effects of PTSD on employment status. Adding this first-order interaction term into our three multivariable models, we found that it was significant only among those separated for other reasons (P=0.02) (data not shown). The significance of the interaction was explained by an association between PTSD and employment status among those separated for more than 2 years whereas no association was found among those separated for 2 years or less. In those separated for more than 2 years, the proportion unemployed

Table 1 Characteristics of Millennium Cohort participants who separated from the US military, by civilian employment status

Baseline* characteristics	Total separated N=9099 (100%) n (%)†		Unemployed n=1579 (17%) n (%)		Employed n=7520 (83%) n (%)		p Value
Reason for separation							
Routinely retired	5488	(60.3)	779	(49.3)	4709	(62.6)	<0.001
Fulfilled service term	2165	(23.8)	417	(26.4)	1748	(23.2)	
Other reasons	1446	(15.9)	383	(24.3)	1063	(14.1)	
Deployment experience							
Not recently deployed	6711	(73.8)	1160	(73.5)	5551	(73.8)	0.042
Deployed with combat	1049	(11.5)	207	(13.1)	842	(11.2)	
Deployed without combat	1339	(14.7)	212	(13.4)	1127	(15.0)	
Positive screen for PTSD‡							
No	8414	(92.5)	1404	(88.9)	7010	(93.2)	<0.001
Yes	685	(7.5)	175	(11.1)	510	(6.8)	
Positive screen for depression§							
No	8578	(94.3)	1433	(90.8)	7145	(95.0)	<0.001
Yes	521	(5.8)	146	(9.3)	375	(5.0)	
Positive screen for panic or anxiety disorder¶							
No	8576	(94.3)	1426	(90.3)	7150	(95.1)	<0.001
Yes	523	(5.8)	153	(9.7)	370	(4.9)	
Occupational category (prior to separation)							
Combat specialist	1129	(12.4)	215	(13.6)	914	(12.2)	<0.001
Officer or executive	729	(8.0)	81	(5.1)	648	(8.6)	
Healthcare	885	(9.7)	183	(11.6)	702	(9.3)	
Electronic equipment repairer or other technical	2627	(28.9)	426	(27.0)	2201	(29.3)	
Communications/intelligence	860	(9.5)	131	(8.3)	729	(9.7)	
Functional support and administration	1734	(19.1)	328	(20.8)	1406	(18.7)	
Craft worker	229	(2.5)	36	(2.3)	193	(2.6)	
Service and supply	742	(8.2)	149	(9.4)	593	(7.9)	
Student, trainee, or other	164	(1.8)	30	(1.9)	134	(1.8)	
Sex							
Male	6826	(75.0)	1010	(64.0)	5816	(77.3)	<0.001
Female	2273	(25.0)	569	(36.0)	1704	(22.7)	
Period of study enrolment							
2001–2003 (panel 1)	7871	(86.5)	1245	(78.9)	6626	(88.1)	<0.001
2004–2006 (panel 2)	1228	(13.5)	334	(21.2)	894	(11.9)	
Disabling illness or injury							
No	8232	(90.5)	1356	(85.9)	6876	(91.4)	<0.001
Yes	867	(9.5)	223	(14.1)	644	(8.6)	
Years separated prior to reported employment status							
Less than 1 year	2732	(30.0)	643	(40.7)	2089	(27.8)	<0.001
1–2 years	3296	(36.2)	527	(33.4)	2769	(36.8)	
More than 2 years	3071	(33.8)	409	(25.9)	2662	(35.4)	
Age at military separation							
Mean (SD)	37.3	(9.1)	36.1	(10.4)	37.5	(8.8)	<0.001
<25 years	1203	(13.2)	316	(20.0)	887	(11.8)	
25–37 years	2216	(24.4)	431	(27.3)	1785	(23.7)	
38–40 years	1688	(18.6)	194	(12.3)	1494	(19.9)	
41–45 years	2444	(26.9)	321	(20.3)	2123	(28.2)	
>45 years	1548	(17.0)	317	(20.1)	1231	(16.4)	
Highest level of education achieved							
Less than bachelor's degree	6842	(75.2)	1261	(79.9)	5581	(74.2)	<0.001
Bachelor's degree or higher	2257	(24.8)	318	(20.1)	1939	(25.8)	
Race/ethnicity							
Non-Hispanic white	6136	(67.4)	1008	(63.8)	5128	(68.2)	<0.001
Non-Hispanic black	1170	(12.9)	264	(16.7)	906	(12.1)	
Other	1793	(19.7)	307	(19.4)	1486	(19.8)	

Continued

Table 1 Continued

Baseline* characteristics	Total separated N=9099 (100%) n (%)†		Unemployed n=1579 (17%) n (%)		Employed n=7520 (83%) n (%)		p Value
Military pay grade							
Enlisted	7133	(78.4)	1303	(82.5)	5830	(77.5)	<0.001
Officer	1966	(21.6)	276	(17.5)	1690	(22.5)	
Service branch							
Army	3600	(39.6)	641	(40.6)	2959	(39.4)	0.278
Navy/Coast Guard	2379	(26.2)	425	(26.9)	1954	(26.0)	
Air Force	2419	(26.6)	407	(25.8)	2012	(26.8)	
Marine Corps	701	(7.7)	106	(6.7)	595	(7.9)	
Marital status							
Never married	2695	(29.6)	639	(40.5)	2056	(27.3)	<0.001
Married	5964	(65.6)	858	(54.3)	5106	(67.9)	
Divorced, separated, or widowed	440	(4.8)	82	(5.2)	358	(4.8)	
Smoking status							
Never smoker	4918	(54.1)	829	(52.5)	4089	(54.4)	<0.001
Past smoker	2484	(27.3)	389	(24.6)	2095	(27.9)	
Current smoker	1697	(18.7)	361	(22.9)	1336	(17.8)	
Alcohol-related problems§							
No	8179	(89.9)	1407	(89.1)	6772	(90.1)	0.257
Yes	920	(10.1)	172	(10.9)	748	(10.0)	
Life stressor score**							
Low/mild stress	8211	(90.2)	1347	(85.3)	6864	(91.3)	<0.001
Moderate stress	743	(8.2)	193	(12.2)	550	(7.3)	
Major stress	145	(1.6)	39	(2.5)	106	(1.4)	
PCS score¶							
<15th percentile (poor health)	2180	(24.0)	514	(32.6)	1666	(22.2)	<0.001
15th–85th percentile (average)	5978	(65.7)	896	(56.7)	5082	(67.6)	
>85th percentile (excellent health)	941	(10.3)	169	(10.7)	772	(10.3)	

*Baseline characteristics were assessed using the most recent survey submitted prior to separation from service.
†Percents may not sum to 100% due to rounding.
‡Evaluated using the 17-item PTSD Checklist-Civilian Version.
§Assessed using the PRIME-MD Patient Health Questionnaire.
¶Measurement of physical health based on the Medical Outcomes Study Short Form 36-Item Health Survey for Veterans.
**Measurement based on the Holmes and Rahe Social Readjustment Rating Scale.
PCS, physical component summary; PTSD, post-traumatic stress disorder.

with PTSD symptoms was twice as high compared to those without PTSD (29.4% vs. 15.4%). This finding suggests that PTSD was likely more of an impediment to finding a job than time for this particular group.

Former Navy and Air Force personnel who routinely retired, had higher odds of unemployment compared with the Army. When we examined other characteristics of former Navy and Air Force members, we found few differences other than proportionally more Navy and Air Force veterans in this stratum retired at a lower pay grade than Army veterans, refuting the potential hypothesis that these service members retired with a more adequate pension for ordinary living. The reason for this finding is unknown; thus, more research is needed to understand service-specific differences in employment paths of retired veterans, which may be possible using data from future Millennium Cohort surveys which will be collecting information on job seeking.

Two important groups, women and non-Hispanic black participants, were at increased odds of unemployment following separation from service. Similarly, the BLS reported that African–Americans had a higher unemployment rate (14.7%) compared with Caucasians (10.7%).[31] By contrast, the March 2011 BLS news release on the employment situation of veterans found little difference in the unemployment rate of male and female service members who joined the military after September 2001 (11.4% and 12.0%, respectively).[31] Further study is warranted to determine why women and black veterans in some cohorts have higher unemployment, when all, theoretically, had equal access to training and opportunity for advancement within the military system.

Current smoking was associated with not having a job among the routinely retired, and no significant association was found between alcohol abuse and job status in multivariable or univariate analyses. Former service members who separated for other reasons and reported alcohol-related problems prior to separation had marginally significantly lower odds of reporting unemployment at follow-up. Though insignificant, this finding appears surprising, but may be explained by working individuals who may misuse alcohol to cope with the stress of their daily responsibilities. It is also important to note that while alcohol-related problems are reported, these are not a necessary indication of functional impairment.

The proportion unemployed in this population is concerning; yet it should not be compared with the national rate, which includes those actively seeking employment as its denominator,[37] and which we could not determine for our

Table 2 Multivariable model of the adjusted odds of unemployment post service by reason for military separation among Millennium Cohort participants (N=9099)

	Reason for military separation					
	Routine retirement (N=5488)		Fulfilled service term (N=2165)		Other reasons (N=1446)	
Baseline† characteristics	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Deployment experience						
Not recently deployed	1.00		1.00		1.00	
Deployed with combat	1.14	(0.87 to 1.50)	1.20	(0.87 to 1.64)	1.00	(0.67 to 1.48)
Deployed without combat	0.86	(0.68 to 1.08)	1.20	(0.88 to 1.64)	1.09	(0.70 to 1.71)
Positive screen for PTSD‡						
No	1.00		1.00		1.00	
Yes	0.71	(0.46 to 1.09)	1.25	(0.82 to 1.91)	1.08	(0.72 to 1.62)
Positive screen for depression§						
No	1.00		1.00		1.00	
Yes	1.67*	(1.05 to 2.63)	0.87	(0.53 to 1.44)	1.02	(0.65 to 1.60)
Positive screen for panic or anxiety disorder§						
No	1.00		1.00		1.00	
Yes	1.63*	(1.10 to 2.43)	0.97	(0.58 to 1.62)	1.45	(0.93 to 2.26)
Occupation category (prior to separation)						
Functional support and administration	1.00		1.00		1.00	
Combat specialist	1.25	(0.91 to 1.71)	0.84	(0.56 to 1.25)	1.14	(0.72 to 1.80)
Officer or executive	0.92	(0.65 to 1.32)	0.82	(0.29 to 2.33)	0.44	(0.15 to 1.25)
Healthcare	1.27	(0.95 to 1.70)	0.69	(0.43 to 1.10)	0.72	(0.44 to 1.17)
Electronic equipment repairer or other technical	1.03	(0.82 to 1.31)	0.68*	(0.47 to 0.98)	0.71	(0.47 to 1.05)
Communications/intelligence	0.88	(0.62 to 1.25)	0.64*	(0.41 to 0.99)	0.75	(0.45 to 1.25)
Craft worker	1.01	(0.60 to 1.72)	0.65	(0.28 to 1.52)	0.56	(0.24 to 1.33)
Service and supply	1.21	(0.87 to 1.69)	0.92	(0.58 to 1.46)	0.79	(0.49 to 1.27)
Student, trainee, or other	1.67	(0.73 to 3.79)	0.71	(0.36 to 1.42)	0.93	(0.40 to 2.20)
Sex						
Male	1.00		1.00		1.00	
Female	1.70*	(1.38 to 2.10)	1.42*	(1.09 to 1.84)	1.17	(0.88 to 1.56)
Period of study enrolment						
2001–2003 (panel 1)	N/A¶		1.00		1.00	
2004–2006 (panel 2)	N/A¶		1.33*	(1.03 to 1.70)	1.63*	(1.21 to 2.18)
Disabling illness or injury						
No	1.00		1.00		1.00	
Yes	1.59*	(1.20 to 2.10)	1.60*	(1.06 to 2.41)	0.92	(0.63 to 1.33)
Years separated prior to reported employment status						
Less than 1 year	1.00		1.00		1.00	
1–2 years	0.57*	(0.47 to 0.68)	0.50*	(0.38 to 0.65)	0.52*	(0.38 to 0.71)
More than 2 years	0.43*	(0.35 to 0.53)	0.39*	(0.29 to 0.52)	0.38*	(0.27 to 0.52)
Age at military separation (10-year intervals)	2.53*	(2.08 to 3.07)	0.76	(0.56 to 1.03)	1.39*	(1.07 to 1.82)
Highest level of education achieved						
Less than bachelor's degree	1.00		1.00		1.00	
Bachelor's degree or higher	0.70*	(0.53 to 0.93)	0.77	(0.41 to 1.44)	0.48*	(0.25 to 0.90)
Race/ethnicity						
Non-Hispanic white	1.00		1.00		1.00	
Non-Hispanic black	1.31*	(1.04 to 1.65)	1.82*	(1.27 to 2.63)	1.55*	(1.06 to 2.28)
Other	1.14	(0.89 to 1.45)	1.13	(0.84 to 1.52)	1.38	(0.98 to 1.96)
Military pay grade						
Enlisted	1.00		1.00		1.00	
Officer	1.10	(0.81 to 1.50)	0.54	(0.23 to 1.29)	0.90	(0.40 to 2.02)
Service branch						
Army	1.00		1.00		1.00	
Navy/Coast Guard	1.38*	(1.10 to 1.75)	1.13	(0.83 to 1.54)	0.76	(0.54 to 1.07)
Air Force	1.46*	(1.16 to 1.83)	1.24	(0.89 to 1.73)	1.29	(0.91 to 1.83)
Marine Corps	0.91	(0.57 to 1.44)	0.84	(0.59 to 1.19)	1.08	(0.61 to 1.90)

Continued

Table 2 Continued

	Reason for military separation					
	Routine retirement (N=5488)		Fulfilled service term (N=2165)		Other reasons (N=1446)	
Baseline† characteristics	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Marital status						
Never married	1.00		1.00		1.00	
Married	0.55*	(0.43 to 0.71)	0.68*	(0.51 to 0.90)	0.91	(0.68 to 1.22)
Divorced, separated, or widowed	0.63*	(0.43 to 0.93)	0.55	(0.24 to 1.24)	0.73	(0.35 to 1.52)
Smoking status						
Never smoker	1.00		1.00		1.00	
Past smoker	0.91	(0.76 to 1.10)	0.88	(0.65 to 1.18)	1.15	(0.83 to 1.61)
Current smoker	1.40*	(1.11 to 1.76)	0.93	(0.70 to 1.24)	1.36	(1.00 to 1.87)
Alcohol-related problems§						
No	1.00		1.00		1.00	
Yes	1.28	(0.91 to 1.81)	0.87	(0.64 to 1.19)	0.70	(0.48 to 1.00)
Life stressor score**						
Low/mild stress	1.00		1.00		1.00	
Moderate stress	1.23	(0.92 to 1.65)	1.80*	(1.22 to 2.66)	1.17	(0.81 to 1.70)
Major stress	0.92	(0.48 to 1.75)	1.11	(0.39 to 3.13)	1.17	(0.59 to 2.34)
PCS score††						
<15th percentile (poor health)	1.57*	(1.30 to 1.89)	1.06	(0.77 to 1.45)	1.64*	(1.23 to 2.19)
15th–85th percentile (average)	1.00		1.00		1.00	
>85th percentile (excellent health)	1.17	(0.87 to 1.56)	1.11	(0.81 to 1.53)	1.14	(0.74 to 1.77)

*Indicates significance at the p<0.05 level.
†Baseline characteristics were assessed using the most recent survey submitted prior to separation from service.
‡Evaluated using the 17-item PTSD Checklist-Civilian Version.
§Assessed using the PRIME-MD Patient Health Questionnaire.
¶This variable was excluded from this model due to insufficient numbers in panel 2, because these participants are generally younger and ineligible for retirement.
**Measurement based on the Holmes and Rahe Social Readjustment Rating Scale.
††Measurement of physical health based on the Medical Outcomes Study Short Form 36-Item Health Survey for Veterans.
N/A, not applicable; PCS, physical component summary; PTSD, post-traumatic stress disorder.

study population. The routinely retired group had the lowest proportion without a job. The mean age of this group was 43 years at the time of separation, and all but two were below the age of 65 years. Thus, these individuals may still desire to work after retiring from the military. The valuable work experience, resources and skills gained during 20 or more years in the military may make these individuals more attractive to employers than others. On the other hand, those separated for other reasons may be the least attractive to employers, or they may not be seeking work, or they may be physically incapable of working. Many were receiving severance pay, as we noted that nearly 50% of this group separated because of a disability and service-connected disabilities with a rating >30% entitle service members who have served less than 20 years to retirement benefits.[38] Additional analyses confirmed that separating from service due to a disability was univariately associated with unemployment postservice (OR, 1.60; 95%CI, 1.26–2.03) (data not shown). Reporting a prior disability did not significantly affect odds of unemployment among this group; however, this may have been due to over-adjustment issues or the diversity of this "other reasons" group. Also, given the high percentage of disability among this group, we linked participant records with the Joint Theater Trauma Registry to examine deployment-related injuries prior to separation. Few injuries were recorded, and no significant associations between deployment injuries and employment status were found in additional analyses; however, lack of significance may have been due to reduced power. Since disabling illnesses or injuries reported at baseline and poor physical health significantly affected unemployment in two-thirds of our groups, further studies are needed to evaluate the impact of military-related injuries on postservice employability.

There were some limitations to this study that should be considered. We could not determine whether the unemployed had been unsuccessfully searching for employment, had recently lost a job, had trouble keeping jobs, were in school/training, were parenting, or were physically unable to work; although separation codes provided some insight. Those who separated for other reasons, in particular, represented a more diverse group of former service members than those who routinely retired or finished their service term. In addition, the number of civilian jobs held or lost since the date of separation was not captured. Personnel files do not provide a detailed description for the reason for separation, so some individuals may have been misclassified based on inaccuracies in these data, or slight differences across service branch separation policies. Survey non-response due to attrition may have also been an issue in this population of separated personnel. Previous research has shown little follow-up non-response bias in the cohort as a whole; however, personnel who separated for reasons other than retirement had a higher probability of follow-up non-response.[39] Also, health outcomes were self-reported, but previous research on this cohort has shown participant data to be reliable.[13 25 40] Mental disorders and behaviours were measured prior to military separation as predisposing conditions;

however, they may fluctuate in severity over time. Whether they would have limited the ability to obtain or hold employment at the time of separation was not determined in this survey. PTSD, depression and panic/anxiety were identified based on self-reported screening tools, not clinical diagnoses. However, standardised instruments with high sensitivity and specificity were used to reduce misclassification error. Although this study population may differ from the full population of recent veterans, research has shown the cohort to be well representative of the US military.[12]

The Millennium Cohort Study provided a unique opportunity to investigate a robust sample of former military personnel and make inferences across all service branches, increasing the generalisability of the findings. The longitudinal design allowed for prospective follow-up of postservice employment, while adjusting for many characteristics. Finally, stigma attached with mental disorders may prevent some individuals from seeking care within the Military Health System; therefore, use of confidential surveys eliciting self-reported symptoms may have allowed for greater capture of mental health morbidity.

CONCLUSION

Employment is influenced by mental and physical health, and may be considered a strong marker of overall health. Not surprisingly, the reason for separation from military service is a strong indicator of postservice employment status. The degree to which reasons for separation vary make investigation of this population complex. Some wish to retire; others seek military occupations for the promise of furthering their education postservice, or for superior on-the-job training, to position them well for future employment. Previous research highlighted retention issues surrounding mental disorders and suggested a higher exit prevalence from the military among those with mental health needs.[3] The current study suggests that screening positive for certain mental disorders like panic/anxiety or depression are associated with reporting unemployment among the routinely retired group, but being deployed during service was not associated with unemployment in any of the groups examined. These data offer a first look at subgroups that may be disadvantaged in achieving postservice employment, though the preponderance of information suggests a military workforce able to find employment after serving. Continued research is necessary to investigate other impactful military-related experiences not measured in this study, and to understand how in-service training and education in subpopulations will influence employment in the future.

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The impact of prior deployment experience on civilian employment after military service

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14. ABSTRACT

Concerns exist over whether mental disorders and combat deployment experience among US military personnel affect postservice employment. The objective was to determine if deployment experience in support of the operations in Iraq and Afghanistan or a positive screen for posttraumatic stress disorder (PTSD), depression, or panic/anxiety disorders were associated with reporting employment after military service. Former US military active duty and Reserve or National Guard personnel from the Millennium Cohort Study were followed for an average of 3.2 years from the time of mental disorder reporting and potential deployment experience to self-reported employment status.

Among all separated personnel except for those who retired with a pension, screening positive for depression, panic, or anxiety did not significantly affect the ability to obtain future civilian employment. Military combat experiences examined in this study and a positive screen for PTSD were not associated with postservice employment status. Screening positive for depression and panic/anxiety disorders predicted higher odds of subsequent unemployment among those who routinely retired with a pension. Most veterans secured civilian careers in fields similar to their previous military occupations.

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